

Generalized Joint Hypermobility and Temporomandibular Disorders Epidemiologic Study

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Introduction and Objectives

Generalized joint hypermobility (GJH) has been considered a predisposing factor for the development of Temporomandibular Disorders (TMDs). The literature refer that GJH is more frequent in females and tend to decrease with age. This study aimed to assess the relationship between GJH and the presence of TMD signs/symptoms and also with TMDs.

Results

From the 1381 students that participate in this study, 75.5% (n=1042) were females and 24.5% males (n=339) (Table 1). The mean age (\pm standard deviation) for females was 21.3 ± 7.2 years and for males 22.6 ± 4.5 years, with significant differences in the age of females and males (t-test, $p < 0.001$). With regard to the distribution of TMD diagnoses it was found that 60.7% (n=838) of the sample had no TMD diagnosis and 39.3% (n=543) had TMD, from those, 23.2% had only one TMD diagnosis and 16.1% have two or more TMD diagnoses (multiple TMD diagnoses). In the sample, 58.7% (n=811) hadn't GJH (BI 0-3) and 41.3% (n=570) had GJH (BI ≥ 4) (Graphic 1).

By univariate analysis, facial pain, difficulty of mouth opening, clicking (symptom and sign), muscular pain, articular pain and female gender are associated with GJH ($p < 0.05$) (Table 1, 2 and 3). Multivariately, GJH, female gender and age increment are significant risk factors for TMD multiple diagnoses ($p = 0.007$; OR=1.53 (95%CI:1.12-2.08); $p = 0.001$ OR=1.98 (95%CI:1.31-2.98); $p = 0.001$; OR=1.06 (95%CI:1.02-1.10), respectively) (Table 4).

Table 3 – Univariate analyses of TMD signs (Clicking, Muscular Pain and Articular Pain) in relation to GJH (OR and 95%CI)

	TMD signs					
	Clicking		Muscular Pain		Articular Pain	
	No	Yes	No	Yes	No	Yes
GJH negative	489 (60.3)	322 (39.7)	475 (58.6)	336 (41.4)	555 (68.4)	256 (31.6)
GJH positive (BI≥ 4)	313 (54.9)	257 (45.1)	263 (46.1)	307 (53.9)	345 (60.5)	225 (39.5)
p	0.046		<0.001		0.002	
OR (95% CI)	1.25 (1.00-1.55)		1.65 (1.33-2.05)		1.41 (1.13-1.77)	

All values reported are n (%) unless otherwise stated.

Conclusions

GJH, female gender and age are risk factors independently associated to multiple TMD diagnoses.

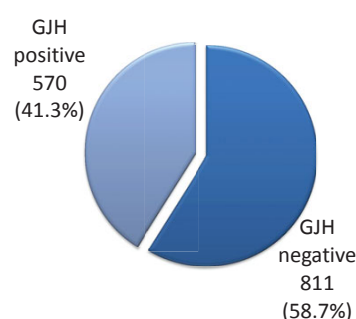
Clinical Implications

Individuals with TMD associated to GJH should be carefully evaluated and in some cases treated by a multidisciplinary team.

Keywords: Temporomandibular Joint, General Joint Hypermobility, Temporomandibular Disorder.

Materials and Methods

Descriptive, cross-sectional, observational study, in 1381 university students from Oporto District. The study protocol was first approved by the Ethics Committee of University Fernando Pessoa and then by all the Institutions that were also visited. Demographic and TMDs symptoms questionnaire and clinical examination using the Portuguese version of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC / TMD) as diagnostic system for TMD. The GJH evaluation was performed using Beighton Index (BI ≥ 4 indicates GJH). Multiple logistic regression to identify risk factors associated to TMDs (one diagnosis or multiple TMD diagnoses; reference: TMD free) (stepwise backward Wald method, $p = 0.05 / 0.10$ for inclusion/ exclusion). Data analysis with IBM[®]SPSS[®] vs 22.0 Statistics ($\alpha = 0.05$).



Graphic 1 - Absolute and relative frequency of Generalized Joint Hypermobility in the sample (n=1381)

Table 1 – Univariate analyses of Gender and Age in relation to GJH (OR and 95%CI)

	Gender		Age	
	Female	Male	18-25 years	> 25 years
GJH negative	539 (51.7)	272 (80.2)	726 (58.1)	85 (64.4)
GJH positive (BI≥ 4)	503 (48.3)	67 (19.8)	523 (41.9)	523 (41.9)
p	<0.001		0.164	
OR (95% CI)	3.79 (2.82-5.08)		0.77 (0.53-1.12)	

All values reported are n (%) unless otherwise stated.

Table 2 – Univariate analyses of TMD symptoms (Facial Pain, Difficulty of mouth opening, Clicking and Crepitus) in relation to GJH (OR and 95%CI).

	TMD symptoms							
	Facial Pain		Difficulty of mouth opening		Clicking		Crepitus	
	No	Yes	No	Yes	No	Yes	No	Yes
GJH negative	452 (55.7)	359 (44.3)	684 (84.3)	127 (15.7)	470 (58.0)	341 (42.0)	789 (97.3)	22 (2.7)
GJH positive (BI≥ 4)	266 (46.7)	304 (53.3)	447 (78.4)	123 (21.6)	287 (50.4)	283 (49.6)	552 (96.8)	18 (3.2)
p	0.001		0.005		0.005		0.630	
OR (95% CI)	1.44 (1.16-1.78)		1.48 (1.13-1.95)		1.36 (1.10-1.69)		1.17 (0.62-2.20)	

All values reported are n (%) unless otherwise stated.

Table 4 – Multivariate analysis of risk factors (GJH, Gender, Age) independently associated to One TMD Diagnosis and Multiple TMD Diagnoses

	TMD free	One TMD Diagnosis			TMD free	Multiple TMD Diagnoses		
	n	n	p	OR (95% CI)	n	n	p	OR (95% CI)
GJH (BI≥ 4)	322	133			322	115	0.007	1.53 (1.12-2.08)
Female Gender	607	248	0.052	1.36 (1.00-1.84)	607	187	0.001	1.98 (1.31-2.98)
Age (1-year increment)							0.001	1.06 (1.02-1.10)

